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PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 11179p	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP 03/10974	International filing date *(day/month/year)* 02.10.2003	Priority date *(day/month/year)* 04.10.2002
International Patent Classification (IPC) or both national classification and IPC A23L1/303		
Applicant FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG... et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
30.04.2004	22.10.2004
Name and mailing address of the international preliminary examining authority: European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer De Jong, E Telephone No. +31 70 340-3849

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP 03/10974

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-19	as originally filed

Claims, Numbers

1-7	as originally filed
8-20	received on 01.10.2004 with letter of 01.10.2004

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐ the language of publication of the international application (under Rule 48.3(b)).

   ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐ contained in the international application in written form.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority in written form.

   ☐ furnished subsequently to this Authority in computer readable form.

   ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐ the description, pages:

   ☐ the claims, Nos.:

   ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-20
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-20
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-20
	No:	Claims	

2. Citations and explanations

see separate sheet

Reference is made to the following documents:
D1 = WO-A-99 51106
D2 = EP-B-0 859 553
D4 = EP-A-1 219 292
D5 = EP-A-1 106 174
D6 = EP-A-0 937 412
D7 = EP-A-0 347 751

Ad V

1. None of the documents cited in the international search report discloses the partial hydrolysis of lupin protein, thus, the subject-matter of claims 1-20 is new (Article 33(2) PCT).

It was known in the art that a modified lupin protein has emulsifying properties (see D1) and that a lupin protein can be hydrolysed (see D2). However, a partial hydrolysis up to a DH of 30% was not disclosed.
It was also known in the art to prepare fat-soluble ingredient compositions, using a partially hydrolysed soy protein as a "protecting colloid" (D4), gelatine/gum as a "matrix component" (D5), fish gelatine as a "swellable colloid" (D6), or fish gelatine as a "protective colloid" (D7).
Since there is no indication as to the use of a lupin protein as a protective colloid, nor to the possibility of improving functional properties (see present p.5 l.1-10 and p.11 l.12-18), the subject-matter of claims 1-20 is also considered to involve an inventive step (Article 33(3) PCT).

2. The description (p.4 l.18-25 and Example 2) remains to be adapted to the amended set of claims, in line with Article 6 PCT and the PCT International Search and Preliminary Examination Guidelines 5.29.

New Claims 8 - 20

8. Modified lupin proteins obtainable according to the process of any one of claim 1-7.

9. Composition, comprising a modified lupin protein according to any one of claims 1–8, and a fat-soluble active ingredient or colorant, and, optionally, adjuvants and/or excipients.

10. A composition as in claim 9 wherein the fat soluble active ingredient or colorant is a carotenoid, a fat soluble vitamin, a triglyceride, an oil soluble UV-A or UV-B filter or a mixture thereof.

11. A composition as in claim 10 wherein the carotenoid is α- or β-carotene, 8'-apo-β-carotenal, 8'-apo-β-carotenoic acid ethyl ester, canthaxanthin, astaxanthin, lycopene, lutein, zeaxanthin or crocetin or mixtures thereof.

12. A composition as in claim 10 wherein the fat soluble vitamin is Vitamin A, D, E or K.

13. A composition as in any one of claims 8-12 wherein at least one of a mono- di-, oligo- or polysaccharide, a triglyceride, a water-soluble anti-oxidant, a fat-soluble anti-oxidant, silicic acid and water is additionally present.

14. A composition as in claim 13 wherein the mono- or disaccharide is saccharose, invert sugar, glucose, fructose, lactose or maltose and the composition optionally contains glycerol in addition.

15. A composition as in claim 13 wherein the polysaccharide is a starch or a starch hydrolysate and /or the triglyceride is a vegetable oil or fat.

16. A composition as in claim 15 wherein the starch hydrolysate is a dextrin or a maltodextrin (in the range of 5-65 dextrose equivalents) or a glucose syrup (in the range of 20-95 dextrose equivalents).

17. A composition as in any one of claims 9-16 wherein the amount of modified lupin protein is from about 0.5 to about 60.0 wt.-% and the amount of fat soluble active ingredient or colorant is from about 0.1 to about 80.0 wt.-%.

18. A process for the preparation of a composition as claimed in any one of claims 9-17 which comprises homogenizing, in an aqueous solution or colloidal solution of the modified lupin protein and optional water-soluble excipients and adjuvants, a solution or dispersion of the fat soluble active and/or colorant and optional fat-soluble adjuvants and, if required, converting the dispersion obtained into a powder.

19. Use of a composition as claimed in any one of claims 9-17 for enrichment, fortification and/or coloration for food, beverages, animal feeds, cosmetics or drugs.

20. Food, beverages, animal feeds, cosmetics or drugs containing a composition as claimed in any one of claims 9-17.

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